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THE SOUTHWEST FLOOD OF 1957

REPORT

OF THE

SPECIAL SUBCOMMITTEE TO INSPECT FLOODED AREAS IN SOUTHWESTERN UNITED STATES

TO THE

COMMITTEE ON PUBLIC WORKS
HOUSE OF REPRESENTATIVES

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SPECIAL SUBCOMMITTEE TO INSPECT FLOODED AREAS IN SOUTHWESTERN UNITED STATES

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CONTENTS

	Page
Scope of the investigation	1
Public hearings	2
Flood conditions at selected localities:	
Lampasas, Tex	4
Fort Worth, Tex	4
Abilene, Tex	5
Dover, Okla	5
Enid, Okla	5
Stilwater, Okla	5
Damages prevented	5
Estimated damages	6
Individual river basin reports:	
Brazos	7
Trinity	8
Colorado	9
Guadalupe-San Antonio	9
Nueces	10
Neches-Angelina	10
Sabine	10
Red	10
Arkansas	11
White	13
Watershed and flood prevention programs of Soil Conservation Service	14
United States Civil Defense Administration	16
Water conservation and storage	17
Conclusions	19
Recommendations	20
Appendix	21

THE SOUTHWEST FLOOD OF 1957

The Southwest has suffered one of the most serious and devastating floods in our Nation's history—a disaster which ranks as 1 of the 6 most destructive floods America has known since 1900.

On the basis of distress reports concerning these floods in the States of Texas, Oklahoma, Arkansas, Kansas, and Louisiana, the Committee on Public Works of the House of Representatives sent a subcommittee consisting of Representatives Jim Wright of Texas, Ed Edmondson of Oklahoma, and Emmet F. Byrne of Illinois to make an inspection of the area.

The purpose of this inspection was threefold: (1) To assess the damage that has been done by the floods; (2) to appraise the effectiveness of the existing flood-control and flood-retarding structures; and (3) to determine what new and remedial measures need to be undertaken to prevent a recurrence of the damage that has occurred.

To accomplish its mission, the subcommittee left Washington on May 29, 1957, by a plane furnished by the Air Force and made a 3-day inspection of the area. During these 3 days the subcommittee flew over 1,700 miles, exclusive of the trip from Washington to the flooded area and return to Washington. Public hearings were held by the subcommittee at Fort Worth, Tex., on May 30, and at Tulsa, Okla., on June 1. These hearings were well attended by representatives from the areas that were hit by floods. Representatives of Federal agencies also furnished information on the flood situation and the effects of the programs of those agencies on the floods.

On its aerial inspection the subcommittee covered an area of 1½ million flooded acres in 4 States, Texas, Oklahoma, Arkansas, and Kansas. At places it was impossible to ascertain the normal location of the river bed, as the swollen streams had cut new channels and in areas had spread out to widths of approximately 5 miles. By strange coincidence, this same area was only recently suffering from a severe drought. In Texas 236 counties of a total of 254 had been declared drought disaster relief areas. All 77 counties of Oklahoma had been so declared. For the past 7 years rainfall had been below normal in Texas, and for 6 years in Oklahoma.

Existing flood-control structures in operation were also inspected. The attached map shows the route flown by the subcommittee. Briefly, the flight covered the upper Brazos River Basin in the vicinity west of Fort Worth to near Austin, the upper and mid-Trinity River Basin, the lower reaches of the Washita River, the Red River from the upper end of Lake Texoma downstream about 200 miles to Fulton, Ark., thence northeast over the authorized site of Millwood Reservoir on Little River to the Arkansas River near Fort Smith, Ark., thence up the Arkansas River to Tulsa, Okla. From Tulsa the route covered the Caney and Verdigris Rivers and tributaries of the Grand (Neosho) River in Kansas, the Arkansas River and its tributaries in Kansas to Wichita, thence to Enid, Okla., and down the Cimarron to Tulsa.

During this flight hundreds of thousands of acres of rich farmlands and countless towns and villages were observed to be under water. In addition to the untold destruction from the floodwaters, the effectiveness of existing flood-control projects authorized by the Committee on Public Works could also be observed in protecting large rural and urban areas. The need for projects authorized but not built could readily be seen. Furthermore, the subcommittee was made aware of additional works requiring further studies to complete the program.

PUBLIC HEARINGS

On May 30 a public hearing was held in Fort Worth, Tex. Approximately 200 persons were present. Representatives of the Corps of Engineers, Department of the Army; Soil Conservation Service, Department of Agriculture; and Federal Civil Defense Administration supplied information as to their programs. The Brazos River Authority (a State agency), the Trinity River Authority (a State agency), and the Texas Association of Soil Conservation Districts also presented testimony, as did spokesmen for the Clear Fork Watershed Association, the East Fork Watershed Association, the North Texas Municipal Water District, the Trinity Improvement Association, and the Fort Worth Water District. Representatives of the following communities informed the subcommittee of their experiences during the recent floods:

Halton City	Lampasas	Abilene
Richland Hills	Tin Top	Denison
Fort Worth	Dallas	Mineola
Temple	South Dallas	Waco

Generally the testimony of the people living in the flooded area was favorable to the work that has been accomplished. Many expressed their gratitude for the protection that has been furnished. However, in South Dallas residents requested a reappraisal of the flood-control plans for the area to provide protection to a recently developed area, which is downstream from the area protected by the Dallas floodway. They also objected to releasing water from the flood-control storage pools in Garza-Little Elm and Grapevine Reservoirs in the Trinity River Basin at such a rapid rate as to maintain a stage of 32 feet on the gage, 4 feet above flood stage. A petition carrying 418 signatures requested immediate action to relieve the flood condition on the Trinity River south of the levees in Dallas.

One objection was received relative to the release of water at the rate of 39,000 cubic feet per second from Lavon Reservoir, on East Fork of the Trinity River near Dallas. This release had been made necessary because of the occurrence of an intense rain when the reservoir was at a high stage. Investigation revealed, however, that the release was considerably less than the inflow.

At the public hearing in Tulsa on June 1, attended by 121 persons, 40 witnesses were heard. Representatives of the following communities informed the subcommittee of their experiences and damages suffered during the recent floods, and made proposals for additional protection:

Bartlesville	Idabel	Tulsa
Enid	Broken Bow	Fort Gibson
Dover	Oklahoma City	Vian
Hennessey	Okmulgee	Fort Smith, Ark.
Bixby	Haskell	Arkansas City, Kans.
Stillwater	Skiatook	Chetopa, Kans.
Poteau	Muskogee	

Generally speaking, representatives of communities that received protection from the existing structures were very complimentary of the planning and operation of those structures. However, some of the towns and adjoining agricultural areas that were unprotected suffered a major disaster. The audience and subcommittee were deeply moved by the heartrending account of what happened to the town of Dover that does not have adequate flood protection. In this community of 500 and adjoining agricultural area damages were estimated to be $1,722,000. Residents of the Arkansas River flood plain below Muskogee were very critical of the operation of Pensacola Dam by the Grand River Dam Authority of Oklahoma, and some also raised questions as to operation of Fort Gibson Reservoir by the Corps of Engineers. They considered that the Pensacola power pool should have been drawn down prior to the flood to provide a larger amount of flood-control storage. In this instance only moderate rainfall was predicted to occur, whereas heavy rain with an everage depth of 4½ inches fell over the watershed of the Grand (Neosho) River, resulting in a major flood. Although operation of Pensacola and Fort Gibson dams reduced the discharge at the mouth of the Grand River from that which would have occurred if the two reservoirs had not been constructed, there was disastrous flooding in the Arkansas River Valley downstream from Muskogee.

When the subcommittee inspected the area much of the land was still under water and an accurate estimate of the damages could not be made. In fact, field surveys are now being carried on to appraise the flood damages and secure basic data that will be necessary in future planning. However, from experience in previous floods, estimates of flood damages were furnished the subcommittee which were considered conservative and may be revised upward as more information becomes available.

Twenty-three persons had lost their lives as a direct result of the floods and hundreds had been injured as of June 1. Total damages were estimated to be about $125 million. However, as this report is being made new evidence is being received of continuing floods in this area. Consequently, this figure and others given elsewhere in this report will undoubtedly require revision upward. Eighteen thousand persons were evacuated from their homes, of whom 7,000 were in Texas and 11,000 in Oklahoma. In some cases residents were evacuated twice.

In Oklahoma 30 cities were seriously damaged. Among the hardest hit were:

Dover	Moffett	Shawnee
Hennessey	Lindsay	Okmulgee
Stillwater	Muskogee	Tulsa
Enid	Skiatook	Bixby
Fort Gibson	Waurika	

Some of the more seriously damaged localities in Texas were:

Lampasas
San Antonio
Matador
Fort Worth
South Dallas
Bellmead
Richland Hills
Hamilton
Williamson County
Brazos River between Possum Kingdom and Whitney Reservoirs
Portions of Burleson and Brazos Counties

It must be recognized that these lists of localities are by no means complete. At the time of the inspection of the area by the subcommittee some of the roads were impassable and representatives could not appear at the hearings. Furthermore, floods occurring after the hearings and continuing as this report is being prepared are affecting more communities.

In addition to receiving information at the public hearings on the current floods and consequent damages, witnesses also requested that investigations be made in previously flooded areas to develop plans for protection of those areas. For example, the city officials of Bartlesville and Tulsa testified in support of investigations of Caney-Bird-Verdigris River Basins to develop a flood-control plan for that area. Presentations have been made to the Public Works Committee in support of those investigations. The need of a flood-control plan for the area is being made manifest by continuous and heavy flooding on these streams in eastern Oklahoma at the time this report is being written. If possible, a survey should be undertaken at an early date to provide the basis for such a plan.

Some of the more spectacular flood conditions at a few selected localities are described in the following paragraphs.

LAMPASAS, TEX.

On May 12, intense rains over the watershed of Sulphur Creek caused a flood at Lampasas 4 feet higher than that of 1936, the maximum of recent record. Local residents report that the flood of May 12 equaled or exceeded the flood of 1873. This recent flood was a major catastrophe to the town of Lampasas, causing the loss of 5 lives and damages estimated at $5.5 million. Thirty-eight homes were destroyed, 46 suffered major damage and 226 others received minor damage. A total of 138 commercial firms were destroyed or severely damaged.

FORT WORTH, TEX.

The city manager of Fort Worth informed the subcommittee that, had Benbrook Reservoir and the Fort Worth Floodway not been built, the 1957 flood would have "washed Fort Worth away." These flood-control measures were very effective in reducing flood losses. However, because of the continued expansion of suburban cities in the metropolitan area, the property subject to flood damage has increased tremendously since the plan of flood protection was recommended to Congress in 1941. The suburban cities of Richland Hills, White Settlement, and Halton City experienced severe damages. The town of Richland Hills was damaged by Big Fossil Creek, which flooded six separate times with intervals long enough between crests for homes to be reoccupied and reinhabited in part before the next

crest. Approximately 4,000 people had to be evacuated. The West Fork of the Trinity was flooding at the time of the public hearing and water was still in the homes along that stream. No estimate of damage was available at that time.

ABILENE, TEX.

The mayor of Abilene informed the subcommittee that about 500 homes in Abilene had been flooded to the extent of completely covering the first floor. Flooding began on April 17 and had continued at intervals to the date of the public hearing. Residents of the area evacuated their homes and returned six times during this period. Several creeks—Elm, Little Elm, and Catclaw, in addition to Cedar and Lytle Creeks—converge at Abilene to flood large areas. Damages were estimated at $500,000.

DOVER, OKLA.

Dover, an unincorporated community of about 500 people, suffered a major disaster when Turkey Creek, swollen by 12 inches of rain, inundated the town on May 16. The Rock Island Railroad embankment provides partial protection, but it was overtopped to a depth of 3 feet. Damages were estimated at $1 million at Dover and the immediate vicinity.

ENID, OKLA.

The same storm that caused the disastrous floods at Dover and Hennessey on May 16 also caused a major disaster at Enid. Rain of 8.27 inches fell in 8 hours on that date at Enid. Boggy Creek flooded 150 blocks within the city, causing damages estimated at $4 million, to 200 homes and 40 business and industrial establishments.

STILLWATER, OKLA.

Intense rains on May 20 caused Boomer Creek to flood about 160 blocks in Stillwater. There were 457 homes affected, causing damages estimated at $750,000.

Damages Prevented

The subcommittee, in its on-the-ground inspection, could see strong evidence of the effectiveness of the flood-control program that has been completed, and in some cases those structures under construction but not yet completed greatly alleviated the flood damages. In addition, numerous witnesses testified as to benefits received from reduction of floods by those structures.

It is estimated by conservative criteria that the works in operation, constructed by the Corps of Engineers, Department of the Army, have prevented damages of $142 million.

The Soil Conservation Service, Department of Agriculture, estimates that damages in the upstream subwatershed of the Washita River Basin would have been reduced 71 percent if the complete watershed program had been in effect. In 14 subwatersheds of that basin damages would have been reduced from $1,500,000 to $438,300, a reduction of $1,061,700. This is typical of results possible through the watershed program, for which complete figures are not available

93725—57——2

for the flooded States, but for which effectiveness has clearly been established.

The following part of the report describes, to the extent possible with the information available, the effectiveness of flood-control programs within the area under study. Both the programs of the Corps of Engineers and of the Soil Conservation Service will be considered.

Construction of large reservoirs comprises the greater cost of the Corps of Engineers' flood-control program, and in terms of flood storage capacity the present status of this major element of their program is:

	Acre-feet	Percent
Works completed or in operation	17,090,000	50
Works under construction	7,950,000	23
Works authorized—not started	9,470,000	27
Total	34,510,000	100

It is apparent from the above figures that the engineers' projects now in operation provide only 50 percent of the flood-control storage presently authorized, and that the projects which were in esixtence were called upon to meet a problem where only half of the needed and authorized storage was available. Preliminary and incomplete estimates indicate that works now authorized but not yet constructed would have prevented about $56 million, or 45 percent of the damage that has occurred. The following table gives a picture of the effectiveness of the program by river basins. While not final, these figures show the scope of this flood disaster and how the flood-control program performed in alleviating the disaster.

Estimated damages

(Statistical data contained in this section of the report, insofar as they relate to Corps of Engineer projects and damage estimates within the various river basins, come from Corps of Engineer sources.)

[In millions of dollars]

River basin	Experienced	Prevented by existing works	Could have been prevented by authorized works
Brazos	$38.0	$26.0	$28.0
Trinity	17.0	81.0	1.0
Colorado	2.7	[1] 5.0	0
Guadalupe-San Antonio	10.3	0	8.5
Nueces	.2	0	[2] 0
Neches-Angelina	.1	0	0
Sabine	2.2	0	[2] 0
Red	11.0	8.0	4.0
Arkansas	38.0	20.0	13.0
White	6.0	7.0	2.0
Total	125.5	142.0	56.5

[1] Damage prevented by dam of Lower Colorado Authority and not included in the Federal total.
[2] No Federal works in this basin.

The estimated damages prevented by existing works given above do not include the effects of the main line levees of the lower Arkansas and Red Rivers.

The subcommittee desires to point out that all of the figures employed in this compilation are based upon the very conservative criteria employed by the Corps of Engineers in computing damages. They include only the directly calculable damages to property. They do not include such indirect damages as weeks of valuable time lost to businesses and wages lost by working men and women. The subcommittee feels that, if all the direct and indirect damages could be taken into account, each of the figures represented in this table would be substantially higher. It is the belief of the subcommittee that total actual damages inflicted by the floods upon the entire 5-State region would approximate $250 million, establishing the current floods of this area as 1 of the 6 most destructive in the United States since 1900.

It is apparent from the above table that, had the authorized program been completed, disastrous floods still would have occurred in unprotected areas, although the total damage would have been greatly reduced. By the figures of the Corps of Engineers, those projects authorized but not yet started could have prevented damages of $56 million. Yet, assuming the completion of all such projects at the time of the floods, damages of $69 million still would have been experienced.

This clearly demonstrates the critical need for further investigations to determine what additions to present planning are necessary in light of these recent floods. Studies need desperately to be made of other areas that suffered large damages but for which no flood-control plans have been prepared, to determine the need and feasibility of flood protection in those areas.

Reference to the above table will establish the conservative estimate that, if all of the authorized program had been completed, residual damages in the Brazos Basin still would have been $10 million, in the Red River Basin $7 million, in the Trinity Basin $16 million, and in the Arkansas River Basin $25 million.

BRAZOS RIVER BASIN

Of all the river basins in Texas, the most severely damaged was the Brazos. Probably the most stunning experience occurred at the city of Lampasas where a flash flood caused a local retardation structure to capitulate. The town found itself suddenly ungulfed in a monumental wave of water, suffering loss of life and almost total destruction of the business district. This local cataclysm left an estimated $5.5 million damage in its wake. Ironically, the municipal water supply in this same central Texas city had gone dry just a few years ago and residents then were hauling water in tank cars for their domestic needs.

The damage on this basin, estimated at $38 million, topped all others in the State largely because the Brazos is, for the most part, without flood protection. The two existing flood-control reservoirs, Whitney and Belton, served effectively to prevent additional damages of some $26 million which otherwise would have occurred. The flood crest at Waco was reduced by 8 feet due to Whitney Reservoir, and flood stages at Valley Junction and Richmond were reduced by 14 feet and 11 feet, respectively.

Serious damages were inflicted upon such other upper basin communities as Granbury, Bennet, Dennis and Tin Top. The town of

Dennis was almost completely covered by the raging waters. In this area between Possum Kingdom Reservoir (operated by the Brazos River Authority) and Whitney Reservoir on the main stem of the Brazos, there is no comprehensive flood-control plan authorized. The subcommittee feels that early attention should be given to developing some feasible plan of treatment for this section.

Much of the damage in the Brazos Basin resulted from heavy uncontrolled flows on such Brazos tributaries as the Little, Leon, Lampasas, and San Gabriel Rivers, where additional works have been authorized. The authorized flood-control plan for the Brazos includes 6 reservoirs with a flood storage capacity of over 2 million acre-feet, and 5 local protection works, which have not been started. It is estimated that these works would have prevented about $28 million of the damage that occurred.

The following tabulation shows the total storage capacity of the existing reservoirs and the maximum amount used during the floods:

Reservoir	Flood-control storage capacity		Storage used as of May 27		Percent of total flood storage used as of May 27
	Acre-feet	Elevation of full pool	Acre-feet	Elevation of water surface	
Whitney	1,630,300	571	1,491,000	568.3	92
Belton	887,000	631	805,000	617.0	67

NOTE.—Other reservoirs on the Brazos are operated by the Brazos River Authority. While not maintained for flood-control purposes, they contributed to a considerable extent to reduce the onrush of the floodwaters in the initial stages of the deluge, since the long dry spell had left them at an unusually low level.

TRINITY RIVER BASIN

In total volume of water, the 1957 floods were probably the greatest ever experienced on the Trinity. It is estimated that the peak flow of the Trinity River at Dallas, if the existing reservoirs had not been in operation, would have been about 190,000 cubic feet per second, or greater than the previous record flood in 1908. This flow was reduced to about 72,000 cubic feet per second by operation of Benbrook, Grapevine, and Lewisville (Garza-Little Elm) Reservoirs, assisted by the smaller water retardation structures upstream.

There were heavy damages in the Fort Worth and Dallas areas in sections not protected by the levee and channel projects. In all, some 5,000 people were evacuated from their homes in these two metropolitan areas. Much of this damage occurred to developments that had encroached upon the flood plain areas during the long period of drought, such as the River Lake County Club near Dallas. Large residential developments were inundated in the Richland Hills and Sunset Acres areas of metropolitan Fort Worth, and it is obvious that engineering surveys should be expedited and new corrective measures devised to protect these areas.

It is estimated, by the Corps of Engineers, however, that the Benbrook Reservoir and floodway prevented damages of over $8 million at Fort Worth; and that Grapevine and Lewisville Reservoirs and the floodway prevented over $60 million in damages at Dallas. In spite of full utilization of flood storage at Lavon Reservoir, the residual flow caused heavy damages on the East Fork of the Trinity below that dam. Some local protection works failed.

The dramatic velocity with which the floods came is illustrated by the fact that Lake Arlington, between Fort Worth and Dallas, was completely full and running over only 27 days after the completion of the dam and the closing of the spillway. Lake Weatherford on the Clear Fork was only a few weeks older, virtually empty in April and full to the brim in May.

Severe agricultural losses were sustained on the mid-Trinity between Dallas and Houston, particularly in the areas of Corsicana and Bryan.

The existing reservoirs and local flood-protection works in the Trinity River Basin prevented damages estimated at about $81 million. Damages set at $17 million occurred. According to these calculations, the reservoirs authorized but not started would have prevented about $1 million in damages.

The volume of runoff from these floods was so great that the flood-control capacities of three of the large reservoirs were excluded and water flowed over their spillways. The following table shows the use of storage in these reservoirs during the flood.

Reservoir	Flood-control storage capacity	Elevation of full pool	Storage used as of May 27	Elevation of water surface	Percent of total flood storage used as of May 27	Flow over spillway
	Acre-feet		*Acre-feet*			*Feet*
Benbrook	170,350	724.0	79,000	710.4	46	
Lewisville	526,700	532.0	679,000	535.5	126	3.5
Grapevine	238,250	560.0	188,000	555.0	50	(1)
Lavon	275,600	490.0	316,400	491.9	113	1.9

[1] Grapevine reservoir filled the flood-control storage in June.

NOTE.—Additional incidental protection was afforded by the exceptionally low water levels at the beginning of the floods in 3 large upstream reservoirs, Bridgeport, Eagle Mountain, and Lake Worth, all maintained by the Fort Worth Water District, and by a number of smaller municipal storage reservoirs.

COLORADO RIVER BASIN

Flooding also occurred on the Colorado River, with damages tentatively set at $2.7 million. The Marshall Ford Dam of the Lower Colorado River Authority was the only project effective during this flood. This project, where the Corps of Engineers is responsible for flood-control operations, stored more than 800,000 acre-feet of floodwaters, and is credited with preventing large damages in Austin and in the valley below. Although the damages prevented were set at $5 million by estimates considered conservative, much greater effects have been claimed locally according to other reports. Further upstream in the Colorado River Basin, the Hords Creek and San Angelo Reservoirs stored a small amount of water, but were outside the heavy-rainfall area.

GUADALUPE-SAN ANTONIO RIVER BASIN

Damages estimated at $10.3 million were reportedly caused by flooding on the Guadalupe-San Antonio River Basins. The authorized flood-control program includes the Canyon Reservoir, now under construction, the San Antonio floodway, which is in the initial construction phase, and Gonzales Reservoir, which has not been started. Estimates indicate that these projects could have prevented approximately 80 percent of the damages reported had they been completed.

NUECES RIVER BASIN

The Nueces River Basin suffered flood damages estimated at $200,000, which were considered relatively small. No Federal projects exist or are authorized for construction on this stream at present.

NECHES-ANGELINA RIVER BASINS

The Neches-Angelina River Basins in southeast Texas suffered some flooding. Damages in unprotected areas were set at approximately $100,000. Four projects have been authorized. Dam B on the Neches River has been completed, and McGee Bend Dam on the Angelina River has been started. Dam A and Rockland Dam on the Neches River have been authorized but not started. Fortunately this area in southeast Texas was spared from this recent flood disaster. However, the subcommittee was encouraged to see the construction and planning and work now going on in this area toward eliminating as far as possible future danger of floods from these two rivers.

SABINE RIVER

Flooding on the Sabine River, which is the boundary between Texas and Louisiana, has caused damages estimated at $2.2 million. There are no Federal flood-control works on the Sabine, and no works authorized at present.

RED RIVER BASIN

In April and May there were two major flood-producing storms over the Red River Basin. The first storm produced a peak stage at Fulton, Ark., downstream from Denison Dam, of 30.5, 3½ feet above flood stage. Without Denison in operation the stage at Fulton would have been 34.8, or a reduction of 4.3 feet. However, during the second storm a stage of 31.1 was reached at Fulton. Consequently, the net reduction at Fulton was the difference between 34.8 and 31.1, or 3.7 feet.

The full capacity of Denison Reservoir was used and water flowed over the spillway to a depth of about 3 feet. After the first storm it was necessary to reduce releases of floodwater from Denison because of strong complaints from developments which had taken place in unprotected downstream areas. Consequently, less flood storage was available in Denison to store the large volume of runoff from the second storm. Damage in unprotected areas along the Red River below Denison was substantial, but would have been much heavier if storage at Denison had not been available.

In the upper basin of the Red River severe flooding occurred along the Washita, with damage at Pauls Valley and Lindsay, Okla. Other tributaries in the upper basin caused damage at Waurika, Okla., and at Wichita Falls, Tex.

Serious flooding along the north bank tributaries below Denison contributed to flows and damages on the main Red River. The three reservoirs authorized, but not yet constructed to control these streams (Boswell, Hugo, and Millwood), would have provided about 4 million acre-feet of storage and would have resulted in greatly reduced damages downstream. Texarkana Reservoir on the Sulphur River, even though not completed, was used to store floodwaters.

The existing Wallace Lake and Bayou Bodcau Reservoirs on small tributaries in Louisiana were used but were largely local in effect.

On the lower Red River, below Fulton, Ark., there has been a large amount of flooding in areas not protected by existing Federal levees. Because of high flood stages and long duration of the flood, drainage of local tributaries has been blocked and between Alexandria and Shreveport, La., backwater areas have been flooded. However, the 467 miles of main line Red River levees are reported in good condition and are protecting large agricultural areas as well as cities of the lower Red River Valley.

Estimates indicate that approximately $8 million in damages were prevented by completed reservoirs and local protection works, exclusive of the main line levees below Shreveport. Damages estimated at $11 million were caused by flooding in unprotected areas. Federal works authorized but not yet started would have prevented about $4 million of this damage, according to estimates available.

The following table shows the flood-control capacity used in the reservoirs in the Red River Basin:

Reservoir	Flood-control storage capacity, acre-feet	Elevation of full pool	Storage used		Percent of total flood-storage used
			Acre-feet	Elevation	
Denison	2,694,000	640.0	3,143,000	643.15	[1] 117
Texarkana	2,509,000	259.5	1,552,000	250.3	[2] 62
Bayou Bodcau	357,300	199.5	129,700	184.4	36
Wallace Lake	88,300	158.0	37,300	151.2	42

[1] Maximum storage and elevation reached June 5, with a depth of 3.15 feet over the spillway.
[2] Maximum storage and elevation reached June 12.

ARKANSAS RIVER BASIN

Some of the most serious floods in the region's history occurred on the Arkansas River and many of its tributaries in eastern Oklahoma, southeastern Kansas, and Arkansas. While levees at Hutchinson, Kans., Tulsa and Jenks, Okla., and uncompleted works at Wichita and Valley Center, Kans., were fully effective, heavy losses were sustained in unprotected areas. The Cimarron River, one of the major destroyers, experienced 3 storms with rainfalls of as much as 10 inches in 24 hours. The cities of Enid, Dover, Stillwater, and Coyle all suffered severe flood damage. The floodway for Enid, which is authorized but not constructed, would have substantially reduced damages.

In the Verdigris River Basin a series of storms occurred and the greatest flood occurred in June. However, the flood runoff did not fill the storage capacity of the existing Fall River Reservoir, although the Hulah Reservoir came very close to reaching its flood-control capacity in mid-June. Four additional reservoirs are authorized for construction in the Verdigris River Basin. Two of them, Oologah and Toronto, now are under construction. The other authorized structures are Neodosha and Elk City (Table Mound) Reservoirs. The town of Skiatook, Okla., suffered severe flood damage. Hulah Reservoir on the Caney River is credited with controlling what would have been the maximum flood of record at Bartlesville during mid-June.

The valley of the Grand (Neosho) River in Oklahoma has been the scene of serious flooding. Flows from this stream have contributed

to flooding in the Arkansas River Valley below Muskogee, Okla. There are two completed reservoirs, which are Pensacola of the Grand River Dam Authority of the State of Oklahoma, and the Fort Gibson Reservoir, operated by the Corps of Engineers. The Corps of Engineers is responsible for the operation of Pensacola for flood control above pool elevation 745. During the early part of the flood, water was stored in both reservoirs to reduce the crest on the Arkansas River. In view of predictions of only light rainfall of from one-eighth to one-half inch, releases were restricted to the amount required for power production. However, rains averaging 4½ inches occurred over the lower part of the Grand River Basin.

Because of the rapid concentration of flow into both reservoirs, from rainfall on the reservoirs and local runoff with peak inflows of 195,000 cubic feet per second into Pensacola and 347,000 cubic feet per second into Fort Gibson, it was necessary to pass 187,000 cubic feet per second from Pensacola and 210,000 cubic feet per second from Fort Gibson, which caused serious flooding. Although detailed information as to the effects of these 2 reservoirs is not available, preliminary data show even more extreme flooding would have occurred without the 2 reservoirs.

Evidence supplied the committee generally supports the conclusion that the reservoirs were operated as efficiently as possible under the extreme weather conditions prevailing, considering the definite limitations in storage space with which the engineers had to contend.

However, the authorized program of flood-control projects in this basin is only partially complete, since four additional reservoirs are authorized for construction upstream in Kansas, and the Markham Ferry Reservoir in Oklahoma is authorized for construction by the Grand River Dam Authority.

Although there was moderate flooding on the Illinois River above Tenkiller Ferry Reservoir, practically no flooding on the Illinois below the dam was reported, from river flow. The Poteau River in Oklahoma, and the Petit Jean and Fourche La Fave Rivers in Arkansas, also saw flood conditions. The capacities of the existing Wister and Blue Mountain Reservoirs on these rivers were exceeded, while Nimrod Reservoir was filled.

Preliminary estimates from the Corps of Engineers for the Arkansas Basin as a whole indicate that damages of about $20 million were prevented by completed reservoirs and local flood protection works. Corps reports also indicate that since flooding continues in parts of the area it is only possible to make an approximation of the damage which has occurred, which the Corps sets at "at least" $38 million, of which they estimate $13 million could have been prevented by projects which have been authorized but not built. It is significant that civil defense damage estimates are higher, indicating the conservative aspect of engineer estimates.

The following table shows the use of flood control storage in the existing reservoirs:

Reservoir	Flood-control storage	Water surface elevation of top of flood-control pool	Flood-control storage used as of May 27	Water surface elevation reached	Percent of flood-control storage used
	Acre-feet		*Acre-feet*		
Pensacola	523,000	755.0	457,000	[1] 753.6	87
Fort Gibson	922,000	582.0	842,000	[2] 580.4	91
Tenkiller Ferry	600,000	667.0	401,000	[3] 658.3	72
Hulah	252,800	765.0	136,000	753.4	51
Fall River	236,000	987.5	57,800	963.4	24
Heyburn	49,500	784.0	7,300	767.8	15
Wister	400,000	502.5	477,000	505.7	119
Blue Mountain	233,000	419.0	274,400	422.5	118
Nimrod	307,000	373.0	256,500	370.2	84
Under construction:					
Oologah	950,000				
Markham Ferry	233,000				
Keystone	1,414,000				
Eufaula	1,428,000				
Toronto	171,000				

[1] Reached an elevation of 755.3 on June 7.
[2] Reached an elevation of 582.0 on June 7.
[3] Reached an elevation of 666.4 on June 7.

WHITE RIVER BASIN

Since late March, there has been a continuous flood on the White River in Arkansas and Missouri. The river has been above flood stage at Newport, Ark., since the middle of April. Operation of the 2 existing reservoirs, Bull Shoals and Norfolk, has resulted in a peak flow of 87,000 cubic feet per second at Newport, which would have exceeded 200,000 cubic feet per second otherwise. It was possible to store over a million acre-feet in the Table Rock project which is now under construction.

Local flood-protection works and completed reservoirs prevented damages estimated at about $7 million. Damages that occurred are estimated at about $6 million. At least $2 million of these could have been prevented by the works under construction or by projects authorized but not yet under construction.

The following table shows the storage capacity used in existing reservoirs during this flood:

Reservoir	Flood-control storage	Water surface elevation of top of flood-control pool	Flood-control storage used as of May 27	Water surface elevation reached	Percent of flood-control storage used
	Acre-feet		*Acre-feet*		
Bull Shoals	2,360,000	695.0	1,563,000	[1] 681.5	66
Norfork	732,000	580.0	486,000	[2] 571.6	66
Clearwater	391,000	567.0	375,600	565.4	96

[1] Elevation of 687.3 reached on June 7.
[2] Elevation of 573.1 reached on June 7.

WATERSHED PROTECTION AND FLOOD PREVENTION PROGRAM OF THE SOIL CONSERVATION SERVICE

Work is being carried on by the Soil Conservation Service, Department of Agriculture, under three different authorizations:

(*a*) The 1944 Flood Control Act authorized work in the following basins:

(1) Trinity (Texas).
(2) Middle Colorado (Texas).
(3) Washita (Oklahoma).

(*b*) The pilot watershed program authorized in the Agricultural Appropriations Act for Fiscal Year 1954, included the following watersheds:

(1) Green Creek, near Dublin, Tex.
(2) Cow Bayou, near Waco, Tex.
(3) Calaveras Creek, near San Antonio, Tex.
(4) Escambia Creek, near Kennedy, Tex.
(5) Double Creek, near Tulsa, Okla.
(6) Six Mile Creek, near Fort Smith, Ark.

(*c*) Work under Public Law 566. No structures had been installed under this program prior to the floods.

In the Trinity River watershed at the start of the storm period, there were 138 floodwater retarding structures with a total storage capacity of 122,800 acre-feet. These structures functioned satisfactorily under continued heavy rains. The only damages to structures were slight gullying on embankments and spillways where adequate vegetation cover had not been established. It has been estimated that the existing structures in the Trinity River watershed prevented $1,080,000 in damages.

The land treatment practices which form an integral part of the watershed protection program also contributed effectively. The value of well-engineered land terraces was vividly portrayed to the committee as it flew over the flood-drenched areas. Where they existed, terraces were holding back long ribbons of water to sink slowly into the earth rather than cascading downhill to add to the overburden of the swollen streams.

Reports were received on the following watersheds as examples of the effectiveness of the program:

(*a*) On Honey Creek, a 30,000-acre tributary of the East Fork of the Trinity, flooding was prevented on 1,000 acres of flood plain lands by 14 of 16 planned floodwater retarding structures. It was estimated that damages of $47,000 were prevented.

(*b*) In the east laterals of the Trinity southwest of Athens, Tex., 4 floodwater retarding structures and 2 diversions above a levee district prevented flooding on 9,733 acres of bottom land, with an estimated savings of $143,900.

(*c*) Gray's Creek, northeast of Corsicana, Tex., has a system of 11 floodwater retarding structures completed. This system prevented flooding on 2,506 acres, with a reduction in flood damages of $36,750.

(*d*) The Clear Fork of the Trinity, above Benbrook Reservoir, where 27 of an authorized 33 structures have been completed, furnishes convincing proof of the value of this program. Plus protecting farming acres and reducing flood damage, these small dams give the Government a magnificent return on its outlay by protecting Benbrook from siltation.

In addition to prevention of flood damages, it was reported that the 138 structures in the Trinity River Basin trapped 5,000 acre-feet of sediment which was prevented from moving on downstream.

A total of 1,116 floodwater retarding structures with a floodwater storage capacity of 990,347 acre-feet are planned in the upper Trinity River Basin. If all planned structures had been built, it is estimated that $8,800,000 of damages would have been prevented, and 40,500 acre-feet of sediment would have been trapped.

Information was received on three of the pilot watersheds in Texas, Green Creek, Cow Bayou, and Escondido Creek. In Green Creek, a tributary of the Bosque River, near Dublin, all 13 of the planned floodwater retarding structures have been completed. It was estimated that these structures prevented damages of $37,900. In Cow Bayou watershed, a tributary of the Brazos River, it was estimated that without land treatment and structural measures the damages would have been $355,000, and with the complete program installed the damages would have been $141,000, a reduction of $214,000. On Escondido Creek, a tributary of the San Antonio River, it was estimated that benefits of $14,000 would accrue to the program.

Although no structures were completed under Public Law 566 in Texas at the time of the floods, planning is being actively carried out, and initiation of construction is anticipated is several watersheds in the near future. The subcommittee was informed that work will begin soon in Johnsons Draw near Ozona, and in Cummins Creek near LaGrange. Construction on others will begin as plans are completed and funds become available in fiscal year 1958. Applications for work under Public Law 566 had been submitted on 120 small watersheds in Texas as of May 28. Of these the State soil conservation board has approved 60 for further investigation. Thirty-two are pending field examination and 16 are planned or in process. Construction is in process or contracts have been let on three.

In Oklahoma, 150 water retarding structures had been completed and were in operation during the storm period. A survey was made of 14 subwatersheds in the Washita River Basin, where work is being carried on under the 1944 Flood Control Act. The damages in those subwatersheds as a result of the storm of May 17–18 were estimated to be about $1,500,000. From the examination of those subwatersheds it was estimated that had all the planned floodwater retarding structures been completed, the damages on the tributaries would have been reduced approximately 71 percent, with a resulting benefit of more than a million dollars. The structures would have prevented about 135,000 acre-feet of runoff from reaching the main stem of the Washita River in time to contribute to the peak flood flow.

It was reported that runoff from the storms in the latter part of May in Double Creek watershed filled the structures to capacity but there was no flooding at that time. Later record rainfalls produced some flooding, however.

Under Public Law 566, 39 applications for work on an area of about 4 million acres have been submitted by the people of Oklahoma. Work plans have been completed on 5 of the watersheds and 4 others have been approved for planning. There is an urgent need for additional planning parties to advance these plans in the flooded areas.

A report was received from the Arkansas State Conservationist as to the effectiveness of the program in Six Mile Creek watershed during

a storm that occurred April 3, 1957. The highest amount of rainfall in the watershed was 5.04 inches in 18 hours. The lowest amount was 3.40 inches. The average rainfall over the watershed was 4.27 inches. Construction of 23 floodwater retarding structures had been completed, as well as a large part of the land treatment. None of the structures were filled during this storm, but 90 percent of the storage capacity was used in 3 structures. The following table shows the reduction in area flooded and reduction of flood damages credited to the program:

	With 23 structures operating	With all planned measures applied	With no planned measures applied	Reduction by planned measures
Area flooded (acres)	5,060	4,147	9,430	5,283
Damages in the flood plain	$6,795	$3,325	$14,375	$11,050

Another severe storm occurred over this watershed on April 26. Incomplete data were available but inspection of the 23 floodwater retarding structures showed that flood-control storage was filled and flow occurred through the emergency spillways of 4 structures. The greatest depth of flow in any structure was 1.57 feet at the maximum stage. No flooding was observed on controlled tributaries or on the main stem except at the lower end of the watershed by backwater from the Arkansas River.

Civil Defense

In addition to the construction programs of the Corps of Engineers and the Soil Conservation Service, the subcommittee was informed of disaster relief activities of the Civil Defense Administration. The President has declared a major disaster area in these States: Texas, Oklahoma, Arkansas, and Louisiana.

Although money spent on flood-relief and rehabilitation work is necessary in such disasters, had the same amount of money been spent on flood-control measures prior to the floods millions of dollars more would have been saved. It was estimated that in Texas $5 million will be spent by the Federal Civil Defense Administration in carrying out relief and rehabilitation work. In addition, the State of Texas and the local governments will spend in excess of $10 million on such work.

In Oklahoma, an additional 1 cent gasoline tax has been imposed to help meet local road and bridge repair expenses caused by flood damage.

The Federal Civil Defense Administration is coordinating the activities of all Federal agencies involved in disaster relief activities. In addition, the Congress has made funds available (1) to alleviate and reduce hazards to public health and safety; (2) for preventive work when disaster exists; (3) for clearance of debris on public and essential property; and (4) for restoration of essential public facilities. This agency has been very active in meeting the immediate needs when disaster struck, in evacuation of people, and preservation of life, but gives credit to the early efficient help provided by local authorities and local relief agencies in the early phases of the flood as the reason for the low number of lives lost during this flood.

One of the most important problems at the time of the field inspection was that of public health, but through the cooperation of State and local health officials the situation was under control. Surveys were being made throughout the area to determine the assistance that could be furnished in clearance of debris and restoration of essential public facilities.

As of the date of the public hearing in Tulsa on June 1, the Federal Civil Defense Administration estimated that 200 bridges in Oklahoma were damaged by floods. Fifty-one of these bridges were constructed under the Federal-aid system. This agency estimated the flood damages in Oklahoma at $40 million, which was somewhat higher than the estimate as of that date of $32 million, made by the Corps of Engineers.

WATER CONSERVATION AND STORAGE

Just as the subcommittee was impressed with the success of existing flood-control projects in the Southwest, and with progress toward further developments in this direction, it was similarly struck by the really tragic loss of literally millions of acre-feet of runoff water which was not impounded for future municipal, industrial, or agricultural use.

In 6 weeks of flooding, the area lost 30.5 million acre-feet of this increasingly precious commodity into the Gulf of Mexico. If the water were valued at 4 cents per thousand gallons, this would amount to an irretrievable loss of $400 million.

The terrible drought, which had lasted for some 7 years prior to April of 1957, had reduced practically this entire area to about one-half the average annual rainfall. Grasses and cover crops, shrubs and lawns, livestock and wildlife had suffered clearly visible damage as sustenance had been sought in vain from the unremitting soil. How valuable this irretrievably lost water would be when again the burning sun relentlessly glares down for months on end requires little imagination.

The subcommittee is convinced that water is not merely a commodity—used to run mills, bathe children and float battleships. Water, particularly in the Southwest, is life itself. It is well known that the area inspected by the subcommittee is extremely well blessed with such natural resources as gas, oil, coal and sulfur; but it is evident that the time is not far distant when any southwestern area with abundant water will be in a more advantageous position than if it possessed the other resources and lacked water.

The amount of water on earth is fixed. This fixed supply is drawn in an endless cycle by the sun from the ocean reservoirs, borne through the sky over vast distances where it again returns periodically to the parched and thirsty earth. It is thence conveyed by river streams back to the ocean where it again is free to be drawn into the magnificent mechanism.

By fathoming this inexorable secret of nature, man has formed a sort of divine partnership with God. He has drilled wells, dug channels, and erected impoundments. Though he has as yet achieved only partial success, man now has learned that by utilizing these methods he can prevent many natural disasters such as floods, dust storms and water shortages.

In considering the overall dilemma of alternating water shortages and surpluses, the subcommittee has become convinced that there is an

answer. The following points should be made clear in any thoughtful analysis of the problem:

1. The water needs of the Southwest are growing and will continue to grow. Not only is the population of the region expanding, but of even greater significance, the per capita consumption of water is advancing markedly. The demands of booming industry, mushrooming municipalities, and productive agriculture are rapidly increasing. Today, with an estimated population increase of some 20 percent, the Southwestern States are consuming approximately 2½ times as much water as they were just 10 years ago.

2. No longer can the region continue as in the past to rely upon underground waters as the primary source of supply. Citizens of the Southwest are taking an estimated 1.6 billion gallons daily from the subterranean storehouse, and water tables in many areas have been falling precipitately. Just as regularly withdrawing more from a bank account than one deposits to that account will ultimately bring an overdraft, many sections of the Southwest are facing the prospect of an overdrawn account in the underground water tables. Irrigation diversions, for example, account for about four-fifths of all the water used in Texas, and most of this is supplied by wells. New supplies required to meet the added water demands which rapidly are being thrust upon the Southwest must be obtained from surface waters now flowing unused through the region.

3. Fortunately, there is abundant stream water within the region to satisfy foreseeable future needs, providing it can be harnessed and then made available where it is needed. Special reports of the Bureau of Reclamation of the Department of the Interior indicate that the streamflow through the region, even in periods of relative drought, would be sufficient to fulfill the entire regional requirement several times over.

4. Since the primary water problem of the Southwest, therefore, is to make the vast river flow serve its needs, a realistic long-range water program must be built around two objectives. First, more water must be impounded at points where it will be accessible and useful for municipalities, industries, and agriculture. The subcommittee believes that in the future it would be extremely shortsighted either to build conservation dams without flood-control storage or flood-control dams without conservation storage at any place in the great southwestern river basins where the dual purpose can feasibly be served. Secondly, a new dimension must be added to future water planning in the Southwest. There is an increasing need to think not only in terms of impounding but in terms also of distribution.

This second objective involves a relatively new concept. Efficient means must be developed for transporting water from areas of abundance to sections of scarcity. While recognizing that water supply has traditionally been a local responsibility, the subcommittee believes that there is an increasing need for Federal-local cooperation in drafting long-range solutions.

The subcommittee has been gratified with progress now being achieved in this regard. Notable progress has come within recent years. Numerous flood-control projects recently completed and now nearing completion have been designed to serve a dual purpose by allocating part of the total capacity for conservation storage, and the subcommittee is pleased to note that municipal and other local governmental units have been increasingly willing to offer financial assistance

to facilitate this type of arrangement. Much more, however, remains to be done in this field of conservation and storage, and in the related field of water transportation, and the subcommittee feels that new methods should be explored to seek new and additional means of serving this end.

CONCLUSIONS

In concluding this statement the subcommittee reports that the inspection on the ground of this tremendous area affected by floods proved that money spent for flood control is a good investment. Equally as dramatic as the millions of dollars in damages inflicted by the uncontrolled water were many more millions of dollars in damages prevented by existing flood-control works throughout the area. Many dams and other structures totally paid for themselves during these floods.

In dollars and cents, the losses avoided in Fort Worth and Dallas far outweigh the total cost of the projects which prevented the losses that otherwise assuredly would have occurred. The total flood-control investment above the rapidly growing areas of these 2 cities amounts to some $67 million. It is reliably estimated that in 6 short weeks these structures prevented losses which would have exceeded $76 million.

Although the existing projects demonstrated their worth in controlling floods, the inadequacies of our present flood-control defenses were obvious. First, only about 50 percent of the authorized reservoir program was in operation. The reservoirs in place have been called upon to do a job which about twice as much storage was intended to perform. This points up the need for speedy completion of those projects that have been planned but not yet started.

Second, had the authorized program been completed, disastrous floods still would have occurred in unprotected areas. This reveals that there is a critical and urgent need for early approval of additional survey funds with which the Corps of Engineers may begin immediately to draft solutions for several glaring inadequacies in our flood-control program. There is an obvious requirement for at least $250,000 over and above the original budget request to expedite new surveys, resurveys, and engineering studies made urgent by these floods in the Southwestern States.

Third, there is a vital need for a balanced program of flood prevention and water resources development which will utilize all existing programs, including projects by the Corps of Engineers, the Bureau of Reclamation, and the Soil Conservation Service. The watershed treatment program of the Soil Conservation Service is necessary to conserve our soil and to control runoff in headwater areas, supplementing the programs of the other agencies in the downstream areas.

Double tragedy has attended the rush of floodwaters down Southwestern streams to the sea. First, of course, was the danger to life and the destruction to property. Second, is the bitterly disappointing realization that the water which went to waste will be desperately needed in the future by cities, industries, and agriculture. It is the belief of the subcommittee that dams built for flood protection should include, wherever possible and to the greatest extent possible, space for the conservation storage of water, particularly so in this region of periodic water shortages and mounting water demand.

Fourth, the question of acquiring flood easements in certain areas below reservoirs should be given consideration by the Public Works Committee, particularly on an interim basis where only part of a system has been completed. This question has been previously submitted to the committee for study and consideration. However, testimony at the public hearings emphasized the need for attention to the problem. It is both a highly technical and serious policy problem.

RECOMMENDATIONS

The subcommittee recommends:

(1) Earliest possible completion of the authorized program. To accomplish this objective sufficient funds should be provided to carry on a continuing construction program consonant with our national needs.

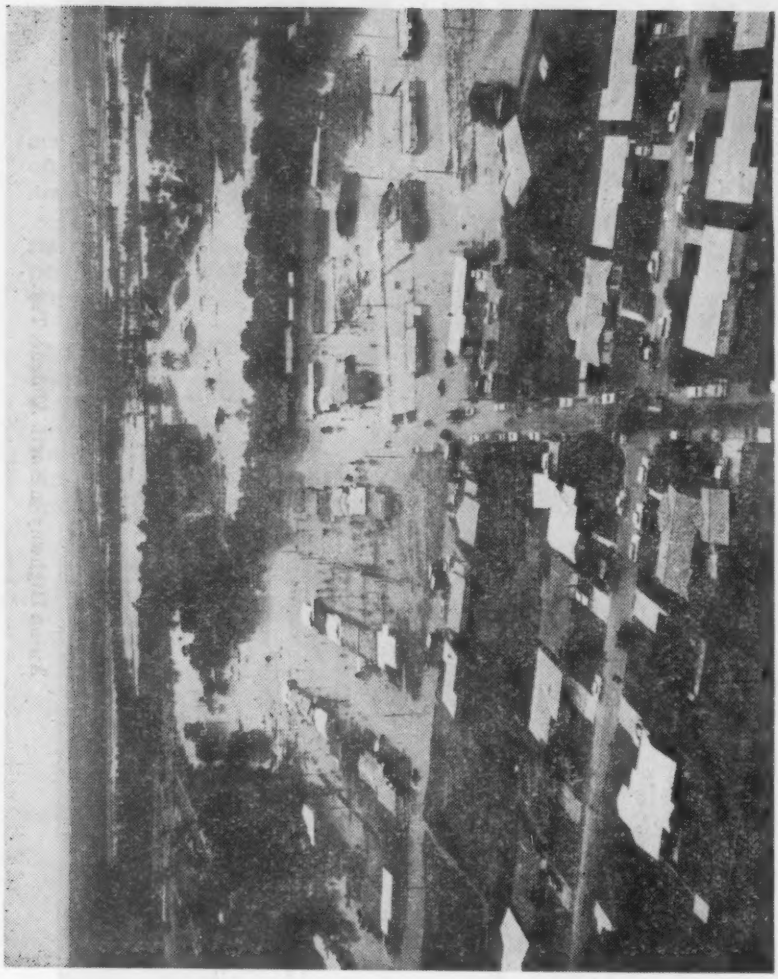
(2) Appropriation of at least $250,000 in addition to those funds recommended in the budget, to permit the Corps of Engineers to expedite new surveys, expand and supplement existing plans, and carry out engineering studies made urgent by the floods in the Southwest.

(3) Acceleration of the upstream program of the Soil Conservation Service including additional planning parties in these badly flooded States to provide a balanced program for the control and development of our water and land resources.

(4) Facilitation to the greatest extent possible in future southwestern projects of water conservation storage in cooperation with local governmental subdivisions to the end that comprehensive development of each river basin may fully be served.

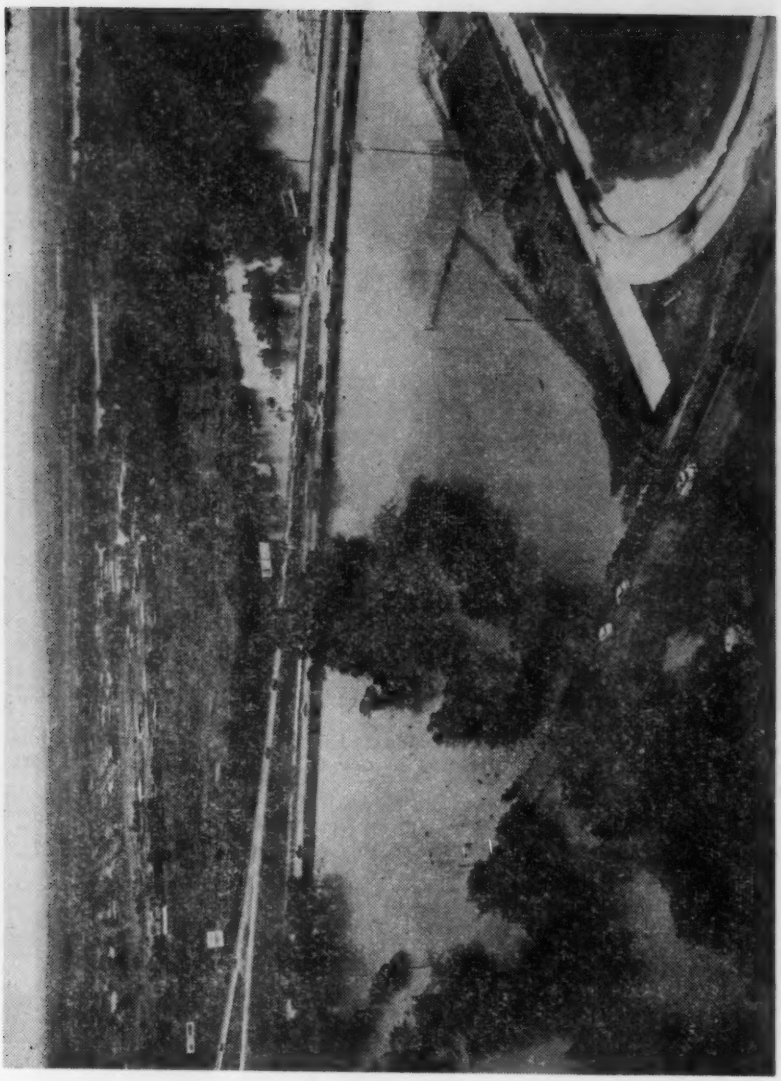
APPENDIX

Anson Highway in North Abilene, Tex.



(Star-Telegram Photo)

Return visit—Flood waters paid return visits to a portion of Richland Hills five times in as many consecutive weeks. This photo shows the spreading water as workers hurry to evacuate residents and possessions.



Little Fossil out of bounds—Little Fossil Creek gushed out of its banks on both sides of Highway 183, sending water into Birdville High School's new stadium and flooding the road behind the school.

(Star-Telegram Photo)

Moving out of water—Furniture was evacuated from hundreds of homes while flood water rose. Above picture was in one of inundated areas near Fort Worth.

(Star-Telegram Photo)

Intersection of Oak Forest Drive and Dennis Avenue, Sunset Acres, Forth Worth, Tex., near the Trinity below Lake Worth Dam. Some 250 homes were affected in this section.

MORE THAN 228,000 SUNDAY CIRCULATION

FORT WORTH STAR-TELEGRAM

SUNDAY EDITION

(CTS)—Chicago Tribune Service • (CDN)—Chicago Daily News (AP)—Associated Press (Five Wires) A Fort Worth Owned Newspaper (INS)—International News Service • (NYT)—New York Times (NANA)—North American Newspaper Alliance

SEVENTY-SEVENTH YEAR, NO. 115. FORT WORTH, TEXAS * * * * Where the West Begins * * * * SUNDAY, MAY 26, 1957. 124 PAGES PRICE FIFTEEN CENTS

3,000-4,000 Flee Floods; Eagle Mountain To Rise 8 Feet; More Rainfall Predicted

Fort Worth Press

Weather: Widely scattered showers today and tomorrow; high in mid 90s.

FINAL HOME EDITION PRICE 5 CENTS

Brazos Spreads Over Thousands of Acres

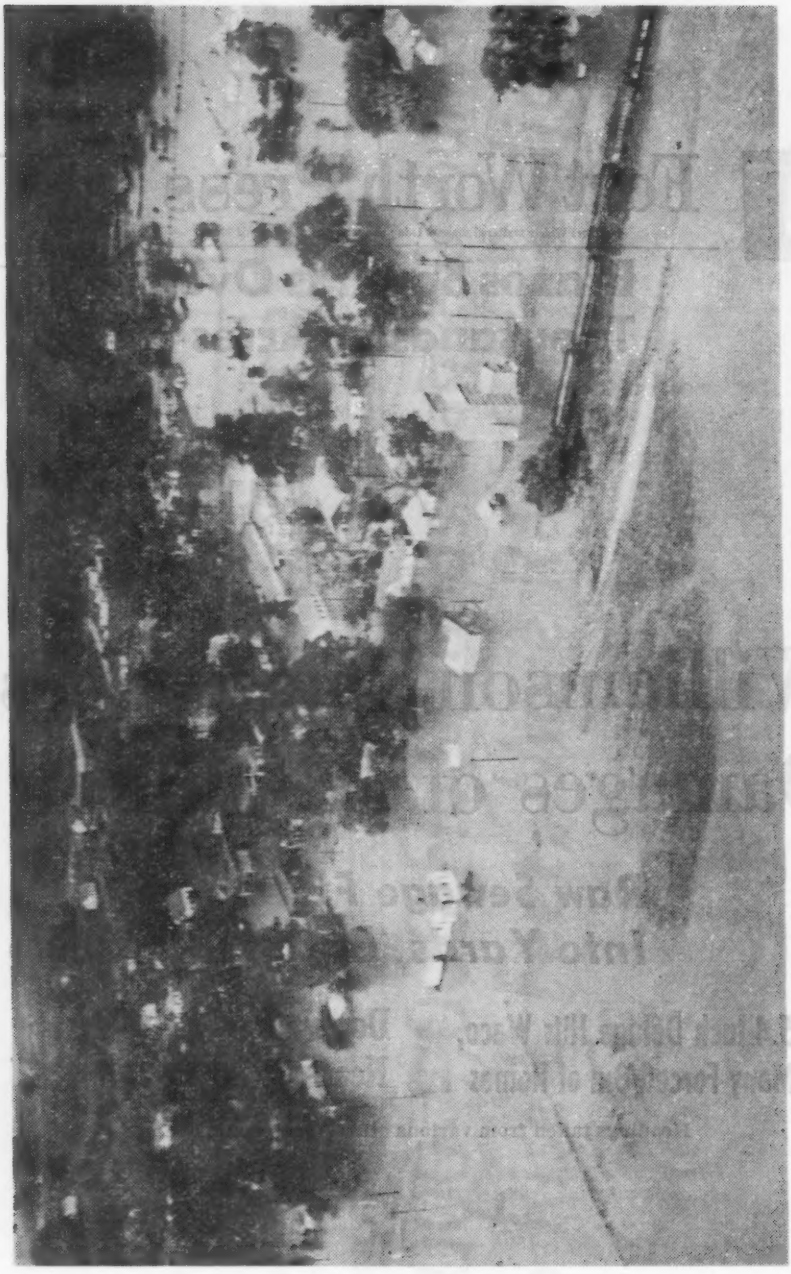
Williamson County Sees Damages of $3 Million

Raw Sewage Flows Into Yards, Gutters

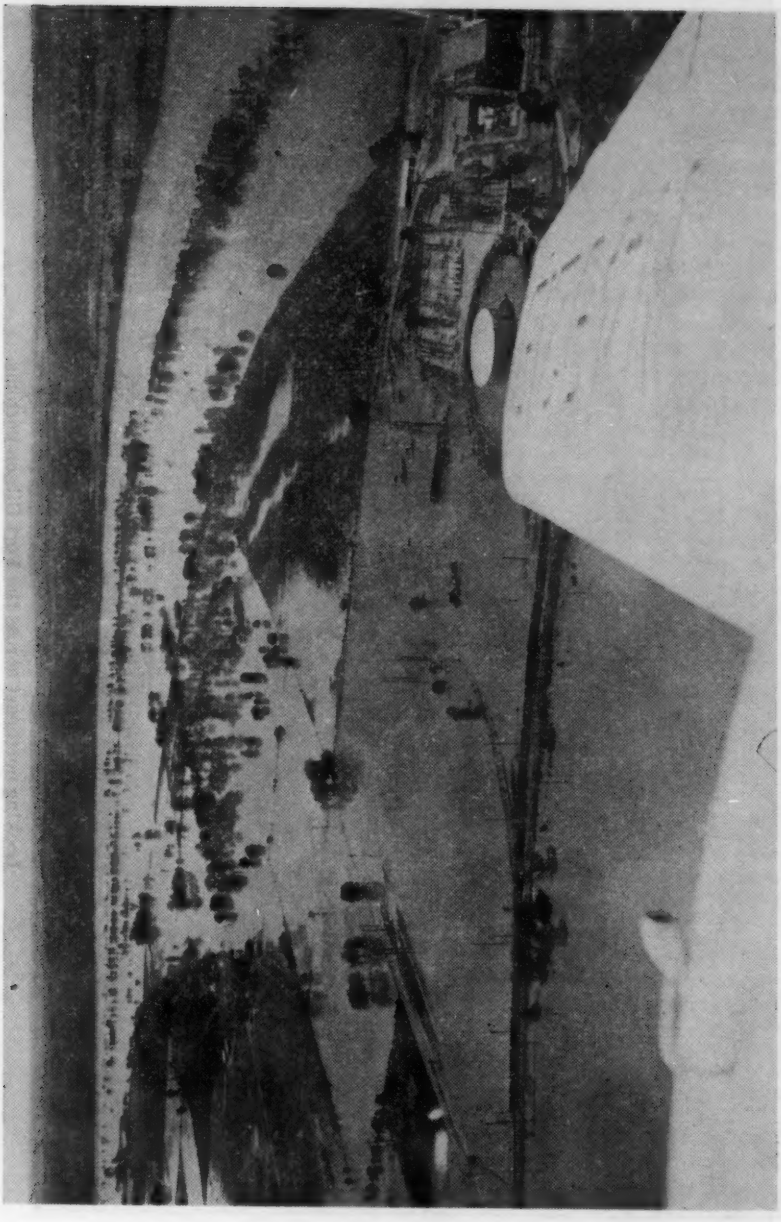
5.4-Inch Deluge Hits Waco, Many Forced Out of Homes

Downpour at Matador Nearly Isolates Town

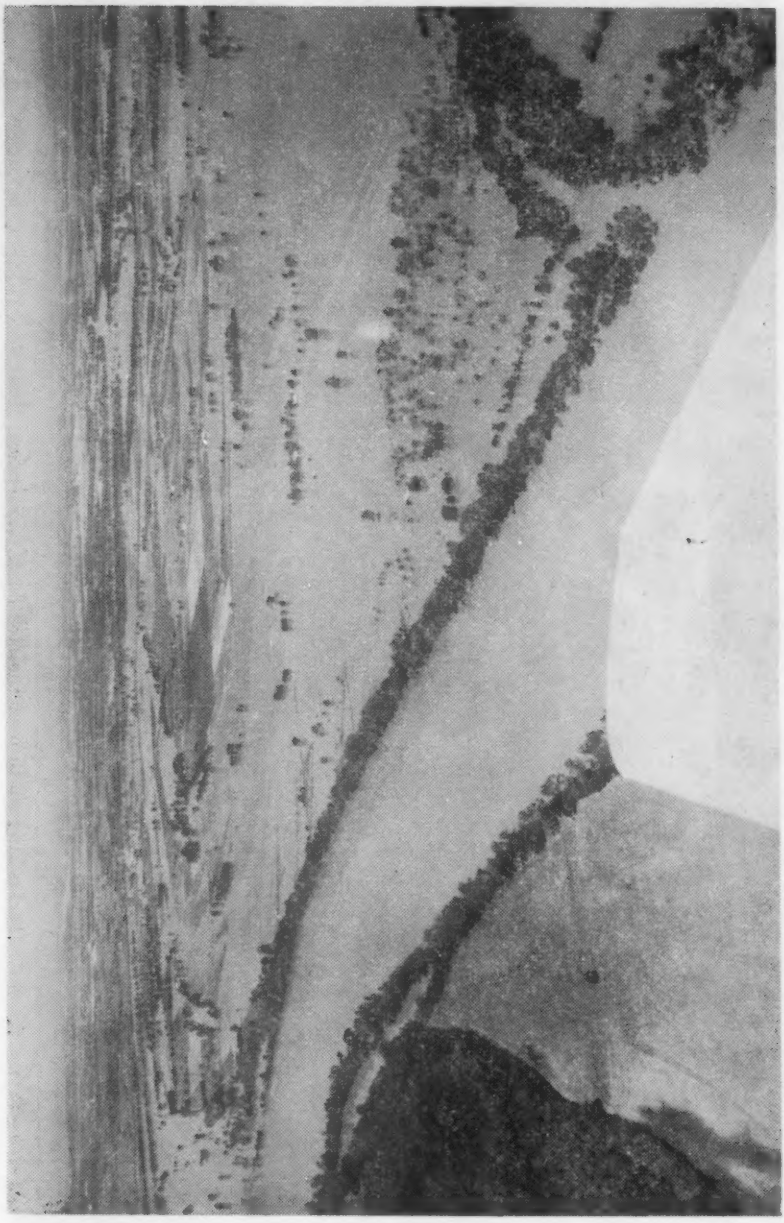
Headings taken from various other Texas newspapers.



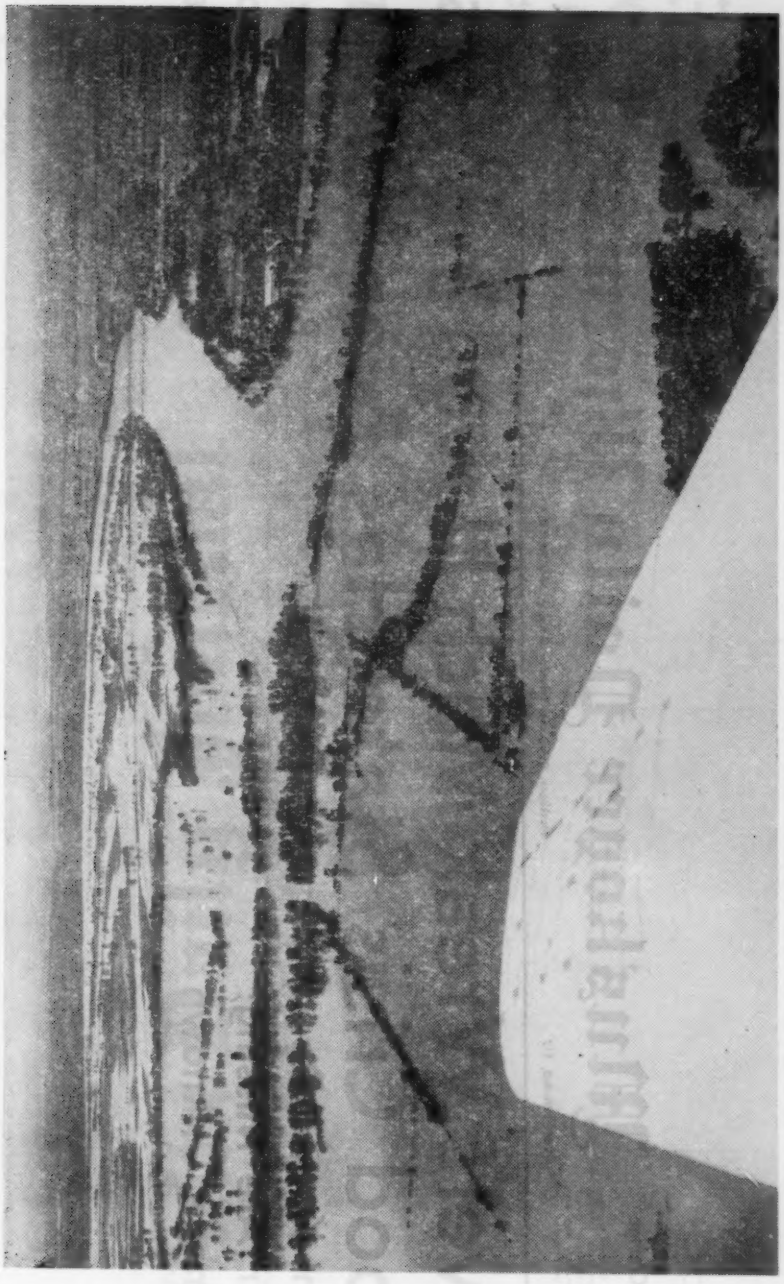
Town of Dover, Okla.



Looking south over the riverbank powerplant, Muskogee.



Looking northeast across the Fort Gibson bottoms.



Looking south down the Arkansas. Grand River on left in Oklahoma.

Little Change

OKLAHOMA — Scattered thunderstorms and continued mild Saturday and Sunday; heavy rains mainly south portion Saturday. High Saturday 60's north to 70's south.

Muskogee Daily Phoenix

VOL. LVII—NO. 117 Muskogee, Oklahoma, Saturday Morning, May 18, 1957 TEN PAGES

Final Home Edition

Price 5c

Rivers Wreak Much Havoc In Worst Flood Crisis State Has Ever Known

Eight Known Dead; Four Are Missing; Damage Unknown

Bridge At Haskell Threatened; Bixby Citizens Evacuate

First In News—Advertising—Circulation—Reader Interest—Community Service

Vinita Daily Journal

VINITA, OKLAHOMA, FRIDAY, MAY 17, 1957 N.E.A. FEATURES PRICE 5 CENTS PER COPY

WEATHER

SCATTERED SHOWERS

Scattered showers, thunderstorms through Saturday. Low tonight 55-65. High Saturday in 70s.

Grand lake level at 8 a. m.— 744.06 feet.

New Rains Pose More Flood Perils In State; Eight Killed

Flooding Cimarron River Is Laying Waste To Wheatland

Over 40 Major Roads Closed Bridges Are Out

Arkansas River Crest At Tulsa Due To Be Seven Feet Above Flood Stage

THURSDAY, MAY 16, 1957

THE ENID DAILY EAGLE

PARALYZING FLOOD WATERS RECEDING

No Deaths, Casualties; $4 Million In Damages

Dover, Hennessey, Bison Areas Hard Hit: Vance Personnel Held At Home

Sequoyah County Times

MOST EVERYBODY IN SEQUOYAH COUNTY READS YOUR TIMES

SALLISAW, Sequoyah County, Oklahoma, FRIDAY, May 31, 1957 Ten Pages 7c Single Copy Number 98

73,000 Acres Of Land Under Water In Sequoyah County

Flood Victims Hit GRDA-PSC For Area High Waters

Bottom Lands Suffer 100 Per Cent Loss In Flooding

Your Morning Home Newspaper

Bartlesville MORNING EXAMINER

Bartlesville, Oklahoma—Saturday Morning, May 18, 1957 (UP) United Press Single Copy Price 5c

State Hit By Greatest Flood In History; Over 30 Deaths In Southwest

Hundreds Fleeing Homes As Eight Inch Rains Fall And Tornado Alerts Are Issued